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Description

LACROSSE STICK HANDLE WITH A REINFORCING INSERT

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority to U.S. Provisional Application Serial No. 60/418,991, entitled "A LACROSSE STICK HANDLE WITH REINFORCING INSERT," filed on October 15, 2002, the disclosure of which is incorporated by reference herein.

BACKGROUND OF INVENTION

[0002] The present invention relates generally to lacrosse sticks, and more particularly to a lacrosse stick having a handle with a reinforcing insert for decreasing the amount of shock transferred to a player's hands and strengthening the handle.

[0003] Lacrosse equipment manufacturers currently produce lacrosse handles that are comprised of metal, e.g. aluminum or titanium. As is known, these handles are adapted for attachment to lacrosse heads. Each handle

typically has a hollow tube construction formed by extrusion or other similar processes. The hollow tube is defined by a single wall separating the exterior of the handle from its interior. This single wall usually has a uniform thickness throughout the tube's length and around the tube's lateral periphery.

[0004] Existing handles are beneficial because they can be substantially strong and lightweight. However, it is understood that a handle, which has even greater strength than the existing ones, would be beneficial. Specifically, a stronger handle would be more durable and resistant to breakage. For that reason, the stronger handle can be used for longer periods of time without having to be replaced or repaired.

[0005] Furthermore, the rigid construction of existing handles can occasionally transmit vibrations and shock to the player's hands. For example, this can occur when a player accidentally strikes the ground with his lacrosse stick as he attempts to scoop up a lacrosse ball. Also, the player may inadvertently strike another player's stick while he is shooting or defending. Additionally, vibrations typically can be transmitted to a player's hand during stick-to-stick contact such as that which occurs during a stick

check. It will be appreciated that a variety of circumstances can result in the handle being significantly jarred so as to cause vibrations to emanate therein to the player's hands.

[0006] It is therefore desirable to provide a lacrosse handle that is substantially strong and lightweight yet can also dampen the level of vibrations in the handle.

SUMMARY OF INVENTION

[0007] It is therefore one advantage of the present invention to provide a handle for a lacrosse stick that has increased strength for maintaining the integrity of the handle.

[0008] It is another advantage of the present invention to provide a lacrosse stick handle that is substantially strong yet lightweight for allowing a player to expend minimal energy while carrying the lacrosse stick.

[0009] It is yet another advantage of the present invention to provide a lacrosse stick handle that decreases the amount of shock transmitted to the player's hands, wrists, and forearms thereby minimizing a player's discomfort when the lacrosse handle is jarred or otherwise struck.

[0010] In accordance with the above and other advantages of the present invention, a lacrosse handle having reinforcing inserts is provided. The lacrosse handle is defined by a hol-

low tube having an outer surface and an inner surface. The inner surface has one or more reinforcing inserts coupled thereto. In one embodiment, each reinforcing insert is comprised of an injection-molded fiberglass composite that contacts substantially the entire inner surface of the handle. Alternatively, in another embodiment, the reinforcing insert is comprised of a foam core or layer. Further, it will be appreciated that the reinforcing insert may instead be constructed of a variety of other suitable materials for reinforcing the hollow tube and supporting the existing structure of the hollow tube. In addition, the reinforcing insert may be adapted for absorbing vibrations emanating through the tube.

[0011] Other objects and advantages of the present invention will become apparent when viewed in light of the detailed description of the preferred embodiment when taken in conjunction with the attached drawings and appended claims.

Brief Description of Drawings

[0012] For a more complete understanding of this invention, reference should now be made to the embodiments illustrated in greater detail in the accompanying drawings and described below by way of examples of the invention:

[0013] Figure 1A is a perspective view of a lacrosse stick handle,

in accordance with one embodiment of the present invention.

[0014] Figure 1B is a perspective view of the lacrosse stick handle in Figure 1A, in accordance with another embodiment of the present invention.

[0015] Figure 2A is a cutaway view of the lacrosse handle shown in Figure 1A, as taken along line 2A-2A.

[0016] Figure 2B is a cutaway view of the lacrosse handle shown in Figure 2A, according to another embodiment of the present invention; and.

[0017] Figure 3 is a logic flow diagram illustrating a method for manufacturing the lacrosse head shown in Figures 1A-2B, in accordance with one embodiment of the invention.

Detailed Description

[0018] In the following figures, the same reference numerals will be used to illustrate the same components in the various views.

[0019] Referring to Figure 1A, there generally is shown a perspective view of a lacrosse stick 10 having a handle 12 attached to a lacrosse head 13. The handle 12 has a pair of reinforcing inserts 14 coupled thereto, in accordance with one embodiment of the invention. These reinforcing inserts 14 are intended to strengthen the handle 12 at a top

end portion 16 and a bottom end portion 18 of the handle 12. However, it is contemplated that the reinforcing inserts 14 can be coupled to other portions of the handle 12, e.g. an intermediate portion 20 of the handle, as well as any combinations thereof. For example, in another embodiment shown in Figure 1B, one reinforcing insert 14" spanning the entire length of the handle 12" can be coupled to the handle 12". In this way, one or more reinforcing inserts 14 can be utilized for strengthening the entire handle 12 or only specific portions of the handle 12 that typically are subjected to the greatest forces. The location of these areas is well known in the art.

[0020] Referring now to Figure 2A, there is illustrated a cutaway view of the lacrosse handle 12 shown in Figure 1A, as taken along line 2A-2A. The lacrosse handle 12 has a hollow tube construction with an outer surface 22 and an inner surface 24. This hollow tube is comprised of metal, e.g. aluminum or titanium, and formed by an extrusion process. However, it is contemplated that the hollow tube can be comprised of various other suitable materials and formed by a variety of other manufacturing processes.

[0021] According this embodiment of the invention, the handle 12 has a reinforcing insert 14 coupled thereto, which is

comprised of a substantially rigid non-deformable material. Preferably, this reinforcing insert 14 is comprised of a fiberglass composite, which is beneficial for its substantially high strength-to-weight ratio. However, it is understood that the reinforcing insert can instead be comprised of other composite laminates or a variety of other suitable materials as desired.

[0022] The reinforcing insert 14 is preferably formed as a thin layer attached to the inner surface 24 of the handle 12. In this way, the reinforcing insert 14 defines a cavity 26 in the handle 12 thereby minimizing the overall weight of the handle 12. However, as seen in Figure 2B, it will be appreciated that the reinforcing insert 14 can completely fill the cavity otherwise defined by the inner surface 24 of the handle 12.

[0023] As shown in Figure 2A, the thickness of the reinforcing insert 14 is uniform around the lateral periphery of the handle 12. In addition, the reinforcing insert 14 is uniform in thickness across the entire length of the handle 12. However, it is contemplated that the thickness and size of the reinforcing insert can vary across and/or around the handle 12 as desired. For example, the thickness of the insert can be increased in areas that are subjected to

maximum force while maintaining a smaller thickness in other locations.

[0024] Referring now to Figure 2B, there is shown a cutaway view of the lacrosse handle 12 shown in Figure 2A, in accordance with another embodiment of the invention. In this embodiment, the reinforcing insert 14 is comprised of a deformable material for both strengthening the handle 12 and dampening vibrations emanating through the handle 12. In this regard, the reinforcing insert 14 is a core of foam material injected into and completely filling the cavity of the handle 12. Although Figure 2B illustrates that the foam material fills the entire cavity of the handle 12, it will be appreciated that a center portion of the cavity may remain unoccupied by the foam material. For instance, a rod may be placed within the handle 12 before the foam material is injected into the cavity. After the foam is injected in the handle 12, the rod can be removed leaving a final cavity or channel defined by the foam material. In this way, the reinforcing insert 14 can be a layer of foam material, which is attached to the inner surface 24 and defines a cavity, rather than a core of foam material. In other words, the foam material can be located within the handle and in contact with the inner surface 24 such that

it does not fill the entire space within the tube.

[0025] Moreover, it is also contemplated that the foam material can be located in one or more portions of the handle 12, or even across the entire length of the handle 12.

[0026] According to yet another embodiment (not illustrated), the reinforcing insert 14 is a membrane or bladder filled with a semi-fluid, e.g. a thick gel. This membrane is sufficiently pressurized within the handle 12 for both supporting the integrity of the handle 12 and absorbing vibrations therein.

[0027] Referring now to Figure 3, there is shown a logic flow diagram for a method of manufacturing the lacrosse handle 12 with one or more reinforcing inserts 14. The method commences in step 100 and then immediately proceeds to step 102.

[0028] In step 102, the lacrosse handle 12 is formed. This step is accomplished by extruding a metal blank to have a hollow tube construction with an outer surface 22 and an inner surface 24. However, it is understood that the lacrosse handle can be comprised of various other materials and formed by other suitable manufacturing processes. Then, the sequence proceeds to step 104.

[0029] In step 104, the reinforcing insert 14 is coupled to the in-

ner surface 24 of the lacrosse handle 12. This step is accomplished by separately forming a substantially rigid non-deformable material that is sized to be press-fitted within the handle 12. For example, a fiberglass composite can be separately cured and otherwise manufactured for insertion into the handle 12 and supporting the integrity of the handle 12. In another embodiment, this step is accomplished by injecting a foam material into the handle 12 for filling the cavity defined by the inner surface 24. In yet another embodiment, this step can be accomplished by inserting a membrane or a bladder into the cavity of the handle 12 and then filling the membrane with a semi-fluid material. This membrane can be sufficiently pressurized for supporting the structural integrity of the handle and absorbing vibrations therein.

[0030] While the invention has been described in terms of selected embodiments, it will be understood, of course, that the invention is not limited thereto since modifications may be made by those skilled in the art, particularly in light of the foregoing teachings.